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CLAIMS

[Claim(s)]

[Claim 1] It is the chlorine generator which is equipped with the following and characterized by the aforementioned controller stopping the energization to an electrode when the chloride-ion concentration which energized to the electrode when the level of chlorine of tap water was below a reference value, changed the chloride ion into chlorine by electrolysis, and carried out multiple-times measurement with the chlorine measuring instrument based on the output of the aforementioned comparator falls rather than a reference value. The tank which stores tap water. The electrode of the couple which is arranged in this tank and contacts tap water. The power supply energized to this electrode. The chlorine measuring instrument which measures the level of chlorine in tap water, the comparator which performs comparison with the level of chlorine measured with this chlorine measuring instrument, and the level of chlorine of criteria, and the controller which performs the energization or a halt to the aforementioned electrode by the output of this comparator.

[Claim 2] It is the chlorine generator according to claim 1 characterized by forming the drain valve attached in the aforementioned tank, and scupper equipment, and for this scupper equipment draining the tap water with which the aforementioned chlorine measuring instrument stopped the energization to the aforementioned electrode when the measured value of multiple times was below a reference value, it opened the drain valve wide in the measurement result of the level of chlorine of multiple times, and stored, and storing new tap water.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the chlorine generator used for sterilization of storage tap water, such as a stored type device (for example, drink vending machine) which stores tap water.

[0002]

[Description of the Prior Art] The level of chlorine in the tap water stored with the passage of time falls, and the sterilization effect of the device which stores tap water is lost. then -- for example, the proposal (JP,61-283391,A) which changes into chlorine the chloride ion which energizes to the electrode of the couple which always contacts tap water in the tank which stores tap water, and is contained in tap water by electrolysis, and improves the sterilization effect should do -- there is also a proposal (JP,2-290293,A) which raised the function further the method of performing fixed time electrolysis at the predetermined time when the former is beforehand set up by the timer -- it is -- the latter -- change of conductivity -- change of chloride-ion concentration -- presuming -- the time of electrolysis -- an amendment -- the yield of chlorine is controlled by things However, with regards to the level of chlorine of the stored tap water, there is nothing, and both will electrolyze into electrolyzing and below the concentration that needs chloride-ion concentration for chlorine generating, and will perform useless energization.

[0003]

[Problem(s) to be Solved by the Invention] In a Prior art, chlorine was generated regardless of the level of chlorine of the stored tap water, and there was a problem of generating or the level of chlorine of a chlorine smell not satisfying a water quality standard (0.1 ppm or more) for after reduction in a chloride ion energizing etc.

[0004]

[Means for Solving the Problem] The electrode of the couple which this invention is arranged in the tank which stores tap water, and this tank, and contacts tap water, The power supply energized to this electrode, and the chlorine measuring instrument which measures the level of chlorine in tap water, The comparator which performs comparison with the level of chlorine measured with this chlorine measuring instrument, and the level of chlorine of criteria, It has the controller which performs the energization or a halt to the aforementioned electrode by the output of this comparator. The aforementioned controller is energized to an electrode, when the level of chlorine of tap water is below a reference value based on the output of the aforementioned comparator, it changes a chloride ion into chlorine by electrolysis, and when the chloride-ion concentration which carried out multiple-times measurement with the chlorine measuring instrument falls rather than a reference value, it stops the energization to an electrode.

[0005] Moreover, the drain valve attached in the aforementioned tank and scupper equipment are formed, and the aforementioned chlorine measuring instrument considers this scupper equipment as the composition which drains the tap water which it stopped the energization to the aforementioned electrode when the measured value of multiple times was below a reference value, and it opened the drain valve wide in the measurement result of the level of chlorine of multiple times, and was stored, and stores new tap water.

[0006]

[Function] The level of chlorine in tap water is measured with a chlorine measuring instrument, and when the level of chlorine is below a reference value, it sterilizes by having energized to the electrode and having changed the chloride ion into chlorine and the chloride-ion concentration of the measurement result of multiple times falls rather than a reference value by the output of the comparator which measured the output of this measuring instrument, and the level of chlorine of criteria, the energization to an electrode is stopped.

[0007] Moreover, when the measurement result of the level of chlorine of multiple times is below a reference value, the energization to an electrode is stopped, the tap water which opened wide and stored the drain valve is drained, and new tap water is stored.

[0008]

[Example] The example of this invention is explained based on a drawing. (1) is tap water. The tank to store, the water service pipe connected with the feed valve (3) which connected (2) with the upper part of the aforementioned tank (1), The drainage pipe which connected (4) with the lower part of the aforementioned tank (1), the electromagnetic drain valve which prepared (5) in this drainage pipe, and (6) are the watering pipes connected with the lower part of the aforementioned tank (1). The opening-and-closing valve (7) which was made to face an opening edge for example, a water supply aperture (not shown), and prepared it in part is opened and closed if needed. The electrode of a couple which consists of a dissimilar material which

arranged (8) and (8) in the aforementioned tank (1), and (9) are the chlorine measuring instruments arranged near the wall of the aforementioned tank (1), and multiple-times measurement of the level of chlorine in tap water is carried out for every predetermined time.

[0009] (10) is a comparator linked to the aforementioned chlorine measuring instrument (9), and it compares and outputs the level of chlorine and the reference value (0.1 ppm or more) which were measured with the aforementioned chlorine measuring instrument (9). It is a controller linked to the aforementioned electrode (8) and (8), (11) is energized to an electrode (8) and (8), when the measured value by the aforementioned chlorine measuring instrument (9) is smaller than an at least 1-time reference value, and when larger than a reference value, it stops the energization to an electrode (8) and (8). (12) is scupper equipment which was coordinated and was connected to the aforementioned feed valve (3), the drain valve (5), and the comparator (10). (13) is a power supply.

[0010] Next, operation is described. When the level of chlorine measured with the chlorine measuring instrument (9) when the storage time of the tap water in a tank (1) was short is a value beyond a reference value, there is no output from a comparator (10) and the energization from a controller (11) to an electrode (8) and (8) is not made.

[0011] For this reason, the various germs in a tank (1) etc. are sterilized in the chlorine contained in tap water from the first.

[0012] However, if storage time becomes long, by evaporation, oxidization, etc., the level of chlorine will fall and sterilization capacity will decrease. Therefore, the level of chlorine which the chlorine measuring instrument (9) measured becomes below a reference value, a comparator (10) outputs, and voltage is impressed to an electrode (8) and (8) from a controller (11). The voltage impression to this electrode performs an electrolysis operation, the chloride ion in water service is changed into chlorine, and a germicidal action is performed. In the energization state of an electrode (8) and (8), it prevents that short hiding ***** becomes [be / under / energization halt / comparing / it] high sharply rather than a reference value about the time between measurements of a chlorine measuring instrument (9).

[0013] While it means *(ing) and a chlorine measuring instrument (9) falling to the value in which, as for the case below a reference value, no measured value of multiple times becomes impossible in the measurement result of the level of chlorine of multiple times as for conversion to chlorine and it stops the energization to an electrode (8) and (8). After draining the storage water in the tank (1) which opens wide and becomes easy to decompose a drain valve (5) with the output of scupper equipment (12) and considering as ****, a drain valve (5) is closed, a feed valve (3) is opened wide, and new tap water is stored.

[0014] The exchange work of the tap water in this case carries out the division-into-equal-parts rate for example, of the inside of a tank (1), changes for every aliquot, when the output of a chlorine measuring instrument (9) becomes beyond a reference value, it returns to the usual level-of-chlorine measurement mode, and if it is energized to an electrode (8) and (8) and it reaches a reference value in not fulfilling a reference value, it will return to the usual level-of-chlorine measurement mode. In not reaching a reference value at this time, further 1 aliquot is replaced and it performs the same check.

[0015]

[Effect of the Invention] this invention measures the level of chlorine in tap water as mentioned above, when the level of chlorine is below a reference value, it energizes to an electrode, and a chloride ion is changed into chlorine, the sterilization effect is held, when the chloride-ion concentration which carried out multiple-times measurement with the chlorine measuring instrument falls rather than a reference value, the energization to an electrode is stopped and useless electrolysis is prevented.

[0016] Furthermore, water without breeding of various germs can be obtained, without spoiling the sterilization effect by securing the level of chlorine of the stored tap water stably, in order to open the drain valve of a tank wide and to replace tap water, while stopping the energization to an electrode, when the measured value of the above-mentioned multiple times is below a reference value.

[Translation done.]

(19)日本特許庁(JP)

(12) 公開特許公報(A)

(11)特許出願公開番号

特開平5-269469

(43)公開日 平成5年(1993)10月19日

(51)Int.Cl. ⁵	識別記号	庁内整理番号	F I	技術表示箇所
C 0 2 F 1/50	C			
1/76	A	9045-4D		

審査請求 未請求 請求項の数2(全3頁)

(21)出願番号 特願平4-67260

(22)出願日 平成4年(1992)3月25日

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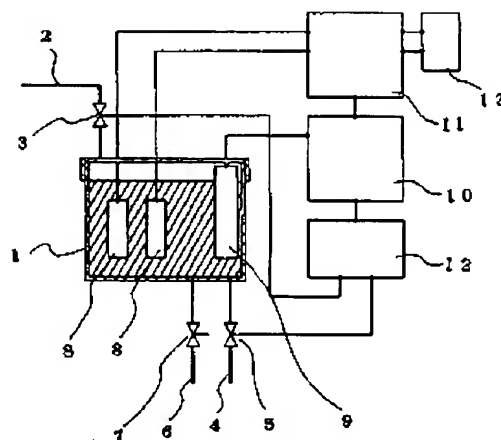
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(54)【発明の名称】 塩素発生装置

(57)【要約】

【目的】 貯溜した水道水を常に安心して飲用等に利用するものである。

【構成】 水道水を貯溜するタンク(1)内に一対の電極(8)(8)を配設し、水道水内の塩素濃度を塩素測定器(9)によって測定し、この塩素濃度が基準値以下の場合には電極に通電して塩素イオンを塩素に変換して殺菌効果を保持し、塩素測定器により複数回測定した塩素イオン濃度が基準値よりも低下したときには電極への通電を停止して不必要な通電を未然に防止する。



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【特許請求の範囲】

【請求項1】 水道水を貯溜するタンクと、該タンク内に配設され水道水と接触する一対の電極と、該電極に通電する電源と、水道水内の塩素濃度を測定する塩素測定器と、該塩素測定器により測定した塩素濃度と基準の塩素濃度との比較を行う比較器と、該比較器の出力によって前記電極への通電或は停止を行う制御器とを備え、前記制御器は前記比較器の出力に基づき水道水の塩素濃度が基準値以下の時は電極に通電して電気分解により塩素イオンを塩素に変換し、塩素測定器により複数回測定した塩素イオン濃度が基準値よりも低下した場合は電極への通電を停止することを特徴とする塩素発生装置。

【請求項2】 前記タンクに取り付けた排水弁と、水抜き装置を設け、該水抜き装置は前記塩素測定器が複数回の塩素濃度の測定結果において、複数回の測定値が基準値以下の時に前記電極への通電を停止し排水弁を開放して貯溜した水道水を排水し新たな水道水を貯溜することを特徴とする請求項1に記載の塩素発生装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、水道水を貯溜する貯溜型機器（例えば飲料自動販売機）等の貯溜水道水の殺菌に用いる塩素発生装置に関する。

【0002】

【従来の技術】水道水を貯溜する機器は、時間の経過と共に貯溜した水道水中の塩素濃度が低下して殺菌効果がなくなる。そこで例えば水道水を貯溜するタンク内に常に水道水に接触する一対の電極に通電し電気分解により水道水に含まれる塩素イオンを、塩素に変換し殺菌効果を向上する提案（特開昭61-283391号公報）がなされ、さらに機能を向上させた提案（特開平2-290293号公報）もある。前者は、タイマーにより予め設定される所定時刻に一定時間電気分解を行う方法であり、後者は、導電率の変化を塩素イオン濃度の変化と推定し、電気分解の時間を補正することで塩素の発生量を制御するものである。しかし、両者とも、貯溜された水道水の塩素濃度に関係無く、電気分解を行うことと、塩素イオン濃度が塩素発生に必要な濃度以下においても、電気分解を行い無駄な通電を行うことになった。

【0003】

【発明が解決しようとする課題】従来の技術では、貯溜された水道水の塩素濃度に無関係に塩素を発生したり、塩素イオンの減少後も通電を行う等のため、塩素臭の発生や塩素濃度が塩素基準（0.1ppm以上）を満足しない等の問題があった。

【0004】

【課題を解決するための手段】本発明は、水道水を貯溜するタンクと、該タンク内に配設され水道水と接触する一対の電極と、該電極に通電する電源と、水道水内の塩素濃度を測定する塩素測定器と、該塩素測定器により測

定した塩素濃度と基準の塩素濃度との比較を行う比較器と、該比較器の出力によって前記電極への通電或は停止を行う制御器とを備え、前記制御器は前記比較器の出力に基づき水道水の塩素濃度が基準値以下の時は電極に通電して電気分解により塩素イオンを塩素に変換し、塩素測定器により複数回測定した塩素イオン濃度が基準値よりも低下した場合は電極への通電を停止するものである。

【0005】また、前記タンクに取り付けた排水弁と、水抜き装置を設け、該水抜き装置は前記塩素測定器が複数回の塩素濃度の測定結果において、複数回の測定値が基準値以下の時に前記電極への通電を停止し排水弁を開放して貯溜した水道水を排水し新たな水道水を貯溜する構成としたものである。

【0006】

【作用】塩素測定器により水道水内の塩素濃度を測定し、この測定器の出力と基準の塩素濃度とを比較した比較器の出力により、塩素濃度が基準値以下の時は電極に通電して塩素イオンを塩素に変換して殺菌を行い、複数回の測定結果の塩素イオン濃度が基準値よりも低下した場合は電極への通電を停止する。

【0007】また、複数回の塩素濃度の測定結果が基準値以下の時に電極への通電を停止して排水弁を開放し、貯溜した水道水を排水し新たな水道水を貯溜する。

【0008】

【実施例】本発明の実施例を図面に基ついて説明する。

（1）は水道水を貯溜するタンク、（2）は前記タンク（1）の上部に連結した給水弁（3）に連結した水道パイプ、（4）は前記タンク（1）の下部に連結した排水パイプ、（5）は該排水パイプに設けた電磁式の排水弁、（6）は前記タンク（1）の下部に連結した導水パイプで、開口端を例えば給水窓（図示せず）に臨ませており一部に設けた開閉弁（7）を必要に応じて開閉する。（8）（8）は前記タンク（1）内に配設した異種材料よりなる一対の電極、（9）は前記タンク（1）の内壁の近くに配設した塩素測定器で、水道水内の塩素濃度を所定時間毎に複数回測定する。

【0009】（10）は前記塩素測定器（9）と接続した比較器で、前記塩素測定器（9）により測定した塩素濃度と基準値（0.1ppm以上）を比較して出力するものである。（11）は前記電極（8）（8）に接続した制御器で、前記塩素測定器（9）による測定値が少なくとも1回基準値よりも小さい場合には電極（8）（8）に通電し、基準値よりも大きい場合には電極（8）（8）への通電を停止する。（12）は前記給水弁（3）と排水弁（5）と比較器（10）に連係、接続した水抜き装置である。（13）は電源である。

【0010】次に動作について述べる。タンク（1）内の水道水の貯溜時間が短い場合には塩素測定器（9）により測定した塩素濃度が基準値以上の値の場合には比較

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器(10)からの出力がなく制御器(11)から電極(8)(8)への通電がなされない。

【0011】このためタンク(1)内等の雑菌はもともと水道水中に含まれている塩素にて殺菌される。

【0012】ところが、貯溜時間が長くなると蒸発や酸化等によって塩素濃度が低下し殺菌能力が低減する。従って塩素測定器(9)が測定した塩素濃度が基準値以下となり比較器(10)が出力して制御器(11)より電極(8)(8)に電圧を印加する。この電極への電圧印加により電気分解作用を行い水道中の塩素イオンを塩素に変換し殺菌作用を行う。電極(8)(8)への通電状態では塩素測定器(9)の測定間隔を通電停止中に較べて短かくして塩素濃度が基準値よりも大幅に高くなるのを防止する。

【0013】斯して、塩素測定器(9)が複数回の塩素濃度の測定結果において、複数回の測定値が何れも基準値以下の場合は塩素への変換ができなくなる値まで低下したこととなり電極(8)(8)への通電を停止すると共に水抜き装置(12)の出力にて排水弁(5)を開放し腐敗しやすくなったタンク(1)内の貯溜水を排水して空室とした後、排水弁(5)を閉じ給水弁(3)を開放して新たな水道水を貯溜する。

【0014】この場合の水道水の入れ換え作業は、例えばタンク(1)内を等分割して、一分割量ごとに入れ換えを行い、塩素測定器(9)の出力が基準値以上になった場合には通常の塩素濃度測定モードに戻り、基準値に満たない場合には電極(8)(8)に通電して基準値に*

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*達すれば通常の塩素濃度測定モードに戻る。もし、この時に基準値に達しない場合にはさらに一分割量の入れ換えを行い同様のチェックを行う。

【0015】

【発明の効果】以上の様に本発明は、水道水内の塩素濃度を測定し塩素濃度が基準値以下の場合は電極に通電して塩素イオンを塩素に変換して殺菌効果を保持し、塩素測定器により複数回測定した塩素イオン濃度が基準値よりも低下した場合は電極への通電を停止し無駄な電気分解を防止する。

【0016】さらに、前述の複数回の測定値が基準値以下の時は電極への通電を停止すると共にタンクの排水弁を開放して水道水の入れ換えを行うため、貯溜した水道水の塩素濃度を安定的に確保することにより殺菌効果を損うことなく雑菌の繁殖のない水を得ることができる。

【図面の簡単な説明】

【図1】本発明の塩素発生装置の説明図である。

【符号の説明】

- 1 タンク
- 5 排水弁
- 8 電極
- 9 塩素測定器
- 10 比較器
- 11 制御器
- 12 水抜き装置
- 13 電源

【図1】

